

AMENDMENTS TO THE CLAIMS¹

1. (Canceled)

2. (Currently Amended) The printed wiring board according to claim ~~1~~7, wherein said first plating layer is a groundwork on which said second plating layer is formed, and gives conductivity to the inner surface of said via.

3-6. (Canceled)

7. (Withdrawn) A method of manufacturing said printed wiring board including said insulating layer having said first surface and said second surface located on the opposite side of said first surface and a plurality of wiring layers formed so as to correspond to a predetermined circuit pattern, said method comprising:

a first step of forming said wiring layers on said first and second surfaces of said insulating layer, respectively;

a second step of forming said via one end of which is opened on said first surface and the other end of which is closed by said wiring layer on said second surface;

a third step of covering said second surface of said insulating layer and said wiring layer formed on said second surface with a first plating resist;

a fourth step of continuously covering said inner surface of said via, said wiring layer on said second surface exposed within said via and said wiring layer on said first surface with said first plating layer;

¹ This listing of claims will replace all prior versions and listings of claims in the application.

a fifth step of covering a region other than a portion where one end of said via is opened out of said first surface of said insulating layer as well as said wiring layer on said first surface with said second plating resist;

a sixth step of laminating said second plating layer on said first plating layer, and electrically connecting said wiring layer on said first surface and said wiring layer on said second surface by said first and second plating layers;

a seventh step of removing said first and second plating resists after an electrical connection is completed between said wiring layers; and

an eighth step of removing said first plating layer exposed on said first surface of said insulating layer along with the removal of said second plating resist.

8. (Withdrawn) The method of manufacturing a printed wiring board according to claim 7, wherein in said second step, said via is formed by irradiating a laser at a position other than said wiring layer out of said first surface of said insulating layer, and said insulating layer is scraped off in the direction from said first surface to said second surface.

9. (Withdrawn) The method of manufacturing a printed wiring board according to claim 7, wherein in said eighth step, said first plating layer is removed by etching.

10. (Withdrawn) A method of manufacturing a printed wiring board, said method comprising:

a first step of obtaining said laminate having said insulating layer having said first surface and said second surface located on the opposite side of said first surface and a plurality of wiring layers laminated on said first surface and said second surface of said

insulating layer and inside of said insulating layer and formed so as to correspond to a predetermined circuit pattern;

a second step of forming said via said one end of which is opened on said first surface of said insulating layer and the other end of which is closed by said wiring layer inside of said insulating layer on said laminate;

a third step of covering said second surface of said insulating layer and said wiring layer laminated on said second surface with said first plating resist;

a fourth step of continuously covering said inner surface of said via, said wiring layer inside of said insulating layer exposed within said via and said wiring layer on said first surface of said insulating layer with said first plating layer;

a fifth step of covering a region other than a portion where one end of said via is opened out of said first surface of said insulating layer as well as said wiring layer on said first surface with said second plating resist;

a sixth step of laminating said second plating layer on said first plating layer, and electrically connecting said wiring layer on said first surface and said wiring layer inside of said insulating layer by said first and second plating layers;

a seventh step of removing said first and second plating resists after an electric connection is completed between said wiring layers; and

an eighth step of removing said first plating layer exposed on said first surface of said insulating layer along with the removal of said second plating resist.

11. (Withdrawn) A method of manufacturing said printed wiring board including insulating layer having first surface and second surface located on the opposite side of said first surface and a plurality of wiring layers formed so as to correspond to a predetermined circuit pattern, said method comprising:

a first step of forming said wiring layers on said first and second surfaces of said insulating layer;

a second step of forming said via one end of which is opened on first surface and the other end of which is closed by said wiring layer on said second surface on said insulating layer;

a third step of covering said second surface of said insulating layer, a region other than a portion where one end of said via out of said first surface of said insulating layer as well as said wiring layers on said first and second surfaces with said plating resist;

a fourth step of continuously covering said inner surface of said via, said wiring layer formed on said second surface exposed within said via and that portion of the wiring layer which is formed on said first surface of said insulating layer and which is other than said plating resist, by use of said first plating layer;

a fifth step of laminating said second plating layer on said first plating layer and electrically connecting said wiring layer on said first surface and said wiring layer and said second surface with said first and second plating layers; and

a sixth step of removing said plating resist after an electric connection is completed between said wiring layers.

12. (Withdrawn) The method of manufacturing a printed wiring board according to claim 11, wherein in said second step, said via are formed by irradiating a laser at a position other than said wiring layer out of said first surface of said insulating layer and scraps off said insulating layer in the direction from said first surface to said second surface by said laser.

13. (Withdrawn) A method of manufacturing a printed wiring board, said method comprising:

a first step of obtaining said laminate having said insulating layer having said first surface and said second surface located on the opposite side of said first surface and a plurality of wiring layers laminated on said first surface and said second surface of said insulating layer and inside of said insulating layer and formed so as to correspond to a predetermined circuit pattern;

a second step of forming said via said one end of which is opened on said first surface of said insulating layer and the other end of which is closed by said wiring layer inside of said insulating layer on said laminate;

a third step of covering said second surface of said insulating layer and a region other than a portion where one end of said via is opened out of said first surface of said insulating layer as well as said wiring layers on said first and second surfaces with said plating resist;

a fourth step of continuously covering said inner surface of said via, said wiring layer inside of said insulating layer exposed within said via and a portion other than said plating resist out of said wiring layer on said first surface of said insulating layer with said first plating layer;

a fifth step of laminating said second plating layer on said first plating layer, and electrically connecting said wiring layer on said first surface and said wiring layer inside of said insulating layer by said first and second plating layers; and

a sixth step of removing said plating resist after an electric connection is completed between said wiring layers.

14. (Canceled)

15. (Currently Amended) The printed wiring board of claim ~~14~~17, wherein the second plating layer ~~has~~ comprises a flange portion laminated on said ~~flange~~ second portion of said first plating layer.

16. (Canceled)

17. (New) A printed wiring board, comprising:

an insulating layer having a first surface, and a second surface located on an opposite side of said first surface;

first to third circuit patterns arranged apart from one another on said first surface, said first to third circuit patterns being formed by etching metal foil deposited on said first surface, said metal foil being plated after the etching, wherein said first circuit pattern is a line through which an electric current flows;

a plurality of fourth circuit patterns formed on said second surface, said fourth circuit patterns being formed by etching metal foil deposited on said second surface, said metal foil being plated after the etching;

a via formed on said insulating layer, said via having one end opened on said first surface of said insulating layer and surrounded by said second circuit pattern on said first surface, and another end closed by a circuit pattern of said plurality of fourth circuit patterns formed on said second surface of said insulating layer;

a first plating layer having (1) a first portion that covers an inner surface of said via and a circuit pattern of said fourth circuit patterns that closes said another end of said via and which is exposed within said via, (2) a second portion covering a part of said second circuit pattern on said first surface, said second portion surrounding said one end of said via and connected to said first portion, and (3) a third portion that covers a part of said first circuit

pattern formed on said first surface such that the first circuit pattern has a part covered by the third portion and a part exposed on the first surface, wherein the first to third portions are simultaneously processed; and

a second plating layer laminated on said first plating layer and electrically connecting said second circuit pattern formed on said first surface with said circuit pattern of the plurality of said fourth circuit patterns that closes said another end of said via, wherein a part of the second plating layer that covers the third portion forms a thick portion in cooperation with the third portion, said thick portion having an increased thickness on a part of said first circuit pattern formed on said first surface and being shorter than said first circuit pattern, wherein a current capacity in said first circuit pattern is increased in said thick portion.

18. (New) A method of manufacturing a printed wiring board, said method comprising:

preparing a metal clad laminate including an insulating layer having a first surface and a second surface located on an opposite side of said first surface, and metal foils respectively covering said first and second surfaces of said insulating layer,

etching said metal foils on said metal clad laminate, thereby forming first to third circuit patterns arranged apart from one another on said first surface of said insulating layer, and forming a plurality of fourth circuit patterns on said second surface of said insulating layer;

forming a via on said insulating layer, said via having one end opened on said first surface of said insulating layer in said metal clad laminate, and another end closed by one of said plurality of fourth circuit patterns formed on said second surface of said insulating layer;

covering said second surface of said insulating layer and said fourth circuit patterns with a first plating resist;

applying a first plating to said metal clad laminate, thereby covering an inner surface of said via, said one of the fourth circuit patterns closing said another end of said via and said first to third circuit patterns on said first surface with a first plating layer;

covering a region of said first plating layer other than regions corresponding to said second circuit pattern, said via, and a part of said first circuit pattern with a second plating resist;

applying a second plating to said metal clad laminate, thereby covering the region of said first plating layer that is not covered by said second plating resist, and forming a thick portion having an increased thickness on a part of said first circuit pattern to increase a current capacity in said first circuit pattern, said thick portion being shorter than said first circuit pattern; and

removing said first and second plating resists from said metal clad laminate, and thereafter removing said first plating layer exposed on said first surface.

19. (New) The method of manufacturing a printed wiring board according to claim 18, wherein said via is formed by radiating said insulating layer on said metal clad laminate with a laser beam.

20. (New) The method of manufacturing a printed wiring board according to claim 18, wherein said part of said first circuit pattern is exposed on said first surface of said insulating layer by forming a slit in said second plating resist.

21. (New) The method of manufacturing a printed wiring board according to claim 20, wherein said slit is shorter than said first circuit pattern.